

What is claimed is:

1. A treatment system comprising:
 - a) two or more conduits for conducting two or more different reagents;
 - b) at least one injection port associated with each of said two or more conduits, said injection ports separately dispensing said two or more different reagents; and
 - c) a diffusion barrier placed between at least two injection ports dispensing different reagents.
2. The system of claim 1 wherein said treatment system is substantially underground.
3. The system of claim 1 wherein said system treats groundwater and/or soil
4. The system of claim 1 wherein said system treats soil or water in a container.
5. The system of claim 3 wherein said container is aboveground.
6. The system of claim 1 wherein one or more of said injection ports comprises a diffuser, well screen, or sprayer.
7. The system of claim 1 wherein one or more of said injection ports comprises a check valve.
8. The system of claim 1 wherein said system comprises a conduit for gas and a conduit for liquid.
9. The system of claim 8 wherein said liquid flows through said conduit at a flow rate between about 0.5 and 25 gpm.
10. The system of claim 8 wherein said liquid flows through said conduit at a flow rate of about 0.5 gpm.

11. The system of claim 8 wherein said gas flows through said conduit at a flow rate between about 0.1 and 150 scfm.
12. The system of claim 8 wherein said gas flows through said conduit at a flow rate above about 15 scfm.
13. The system of claim 8 wherein said gas comprises at least one of ozone, oxygen, or air.
14. The system of claim 8 wherein said gas comprises ozone.
15. The system of claim 8 wherein said gas comprises air.
16. The system of claim 8 wherein said liquid comprises hydrogen peroxide.
17. The system of claim 8 wherein one or more of said two or more reagents are pulsed through said conduits.
18. A system for treating groundwater and/or soil comprising:
 - a) two or more conduits for conducting two or more different reagents into said groundwater through a bore hole;
 - b) at least one injection port associated with each of said two or more conduits for dispensing said two or more different reagents, wherein at least two of said injection ports are at different points along the length of said bore hole;
 - c) a diffusion barrier placed in said bore hole between said at least two injection ports, preventing substantial contacting of at least two different reagents within said bore hole.
19. The system of claim 18 wherein said diffusion barrier comprises bentonite or grout.
20. The system of claim 18 wherein said system comprises two conduits.

21. The system of claim 18 wherein said bore hole is packed with sand around said injection ports.
22. The system of claim 18 wherein said bore hole is packed with a further diffusion barrier above said injection ports.
23. The system of claim 18 wherein said injection ports comprise a diffuser, well screen, or sprayer.
24. The system of claim 18 wherein one or more of said injection ports comprises at least one check valve.
25. The system of claim 18 wherein said system comprises a conduit for gas and a conduit for liquid.
26. The system of claim 25 wherein said liquid flows through said conduit at a flow rate between about 0.5 and 25 gpm.
27. The system of claim 25 wherein said liquid flows through said conduit at a flow rate of about 0.5 gpm.
28. The system of claim 25 wherein said gas flows through said conduit at a flow rate between about 0.1 and 150 scfm.
29. The system of claim 25 wherein said gas flows through said conduit at a flow rate above about 15 scfm.
30. The system of claim 25 wherein said gas comprises ozone, oxygen, or air.
31. The system of claim 25 wherein said gas comprises ozone.

32. The system of claim 25 wherein said gas comprises air.
33. The system of claim 25 wherein said liquid comprises hydrogen peroxide.
34. The system of claim 18 wherein said two or more reagents are pulsed through said conduits.
35. A system for treating groundwater and/or soil comprising:
- a) two conduits for separately conducting a first reagent comprising hydrogen peroxide and a second reagent comprising ozone into said groundwater through a bore hole;
 - b) an injection port at the end of each conduit, wherein said injection ports are at different points along the length of said bore hole;
 - c) a diffusion barrier placed in said bore hole between said two injection ports, preventing substantial contacting of said hydrogen peroxide and said ozone within said bore hole prior to their diffusing out of said bore hole.
36. The system of claim 35 wherein said injection port of said conduit conducting ozone is a diffuser.
37. The system of claim 35 wherein said injection port of said conduit conducting hydrogen peroxide comprises a well screen.
38. The system of claim 35 wherein said injection port of said conduit conducting hydrogen peroxide comprises a check valve.
39. A system for treating groundwater and/or soil comprising:
- a) one conduit for conducting two or more different reagents into said groundwater through a bore hole;
 - b) one injection port associated with said conduit for dispensing said two or more different reagents;

c) a diffusion barrier placed in said conduit above said injection port, isolating reagent injection location to a minimum depth within the borehole .

40. The system of claim 39 wherein said diffusion barrier comprises a well packer.

41. The system of claim 39 wherein said bore hole is packed with sand around said injection port.

42. The system of claim 39 wherein said injection port comprises a diffuser, well screen, or sprayer.

43. The system of claim 39 wherein said reagents comprise air and hydrogen peroxide.

44. The system of claim 39 wherein said reagents flow through said conduit at a flow rate of about 0.5 gpm to 20 gpm.

45. The system of claim 39 wherein said reagents flow through said conduit at about 1 scfm to 30 scfm.

46. The system of claim 39 wherein said system comprises a reagent line for gas and a reagent line for liquid in said conduit, wherein said reagent lines terminate within said injection port.

47. The system of claim 46 wherein said reagent lines each terminate at different points within said injection port.

48. The system of claim 46 wherein a further diffusion barrier is placed in said conduit between the termini of the reagent lines.

49. The system of claim 48 wherein said further diffusion barrier is a well packer.

50. The system of claim 46 wherein said gas flows through said reagent line at a flow rate from about 0.1 to about 150 scfm.
51. The system of claim 46 wherein said gas flows through said reagent line at a flow rate from about 1 to about 30 scfm.
52. The system of claim 46 wherein said gas flows through said reagent line at a flow rate above about 15 scfm.
53. The system of claim 46 wherein said liquid flows through said reagent line at a flow rate between about 0.5 and about 25 gpm.
54. The system of claim 46 wherein said liquid flows through said reagent line at a flow rate between about 0.5 gpm and about 10 gpm.
55. The system of claim 46 wherein said liquid flows through said reagent line at a flow rate between about 2 gpm and about 5 gpm.
56. The system of claim 46 wherein said liquid flows through said reagent line at a flow rate of about 0.5 gpm.
57. The system of claim 46 wherein said gas comprises air and said liquid comprises hydrogen peroxide.
58. A method of treating a body of water and/or soil comprising injecting two or more reagents into said body of water and/or soil using the system of claim 1 or claim 39.
59. The method of claim 58 wherein said body of water is groundwater.
60. The method of claim 58 wherein said treating occurs in situ.

61. The method of claim 58 wherein said two or more reagents comprise air and hydrogen peroxide or ozone and hydrogen peroxide.
62. The method of claim 58 wherein at least one reagent is hydrogen peroxide which is injected at a flow rate above about 0.5 gpm.
63. The method of claim 58 wherein at least one reagent is hydrogen peroxide which is injected at a flow rate at or above about 2 gpm.
64. A method of reducing organic compounds dissolved or suspended in a body of water and/or soil comprising injecting two or more reagents into said body of water and/or soil using the system of claim 1 or claim 39.
65. The method of claim 64 wherein said organic compounds are VOCs, MTBE, BTEX, TBA, or TAME.
66. A method of increasing dissolved oxygen in a body of water and/or soil comprising injecting two or more reagents into said body of water and/or soil using the system of claim 1 or claim 39.
67. A method of treating groundwater and/or soil comprising contacting two or more reagents, wherein said contacting occurs after said two or more reagents have diffused into said groundwater from separate conduits or separate points at an injection port within a single conduit, where said separate conduits or separate points are separated by a diffusion barrier.
68. The method of claim 67 wherein said treating is in situ.
69. The method of claim 67 wherein said groundwater and/or soil is in a container.
70. The method of claim 67 wherein at least one of said two or more reagents reacts with organic molecules dissolved or suspended in said groundwater and/or adsorbed in soil.

71. The method of claim 67 wherein at least one of said two or more reagents oxidizes organic molecules dissolved or suspended in said groundwater and/or adsorbed in said soil.
72. The method of claim 67 wherein said contacting produces a further reagent that can react with organic molecules dissolved or suspended in said groundwater and/or adsorbed in said soil.
73. The method of claim 67 wherein one of said two or more reagents comprises hydrogen peroxide and another of said two or more reagents comprises one or more of ozone, oxygen, and/or air.
74. The method of claim 67 wherein said organic molecules comprise pollutants.
75. The method of claim 74 wherein said pollutants are VOCs, MTBE, BTEX, TBA, or TAME.
76. The method of claim 67 wherein said two or more reagents are injected below ground into said water and/or soil.
77. The method of claim 67 wherein two of said two or more reagents are ozone and hydrogen peroxide.
78. The method of claim 67 wherein two of said two or more reagents are air and hydrogen peroxide.
79. The method of claim 77 wherein said ozone is injected into the ground at a deeper level than said hydrogen peroxide.
80. The method of claim 67 wherein said diffusion barrier is located inside said bore hole.

81. The method of claim 67 wherein said diffusion barrier is located inside a conduit.
82. The method of claim 81 wherein said diffusion barrier is a well packer.
83. The method of claim 67 wherein said bore hole is about 2 to about 12 inches in diameter and about 2 to about 100 feet deep.
84. The method of claim 67 wherein said bore hole is packed with sand at said injection ports.
85. The method of claim 67 wherein said diffusion barrier comprises bentonite or grout in said bore hole.